

Conference Abstract

# Interactive Checklists to Increase Access to Urban Biodiversity Information in Guatemala

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## Abstract

The [Guatemala Biodiversity Portal](#) (GBP) is a customized platform developed with [Symbiota](#) (Gries et al. 2014) for the digitization of local natural history collections and research projects (Orellana et al. 2023). Currently, the portal includes 42 virtual profiles for the live management of biodiversity data and already hosts more than 50,000 specimen and observation [records](#). Additionally, over 400,000 records of Guatemalan specimens in international collections have been imported from other [Symbiota portals](#) and the [Global Biodiversity Information Facility](#) (GBIF), increasing accessibility to data from the country. A bilingual interface (English-Spanish), and integrated tools to generate interactive checklists (Pearson and Walker 2021) have also encouraged use of the portal to develop online resources to explore and share knowledge of Guatemalan biological diversity.

In particular, urban green spaces in Guatemala City have been a recent focus of attention due to their significance in biodiversity conservation (Castillo-Cabrera et al. 2021). Efforts to study and preserve these natural spaces include biological surveys to compile an



updated inventory of species and assess their conservation status. To increase access to the information obtained, observations and specimens (e.g., [fauna](#), [flora](#)) are being digitized and managed in the GBP, granting instant availability of the records and images derived from the surveys. At the same time, data from protected or threatened species remains [redacted](#) from the general public. Complementary to the surveys in Guatemala City, a more extensive inventory of species is being generated with selected specimens and observations available in the GBP and GBIF. A series of [interactive checklists](#) in the GBP (Fig. 1) facilitate the management of the scientific names, digital vouchers, and annotations about known conservation status (CONAP 2022, IUCN 2024), establishment means, and references in the literature. Information gathered for each species is later added to the [taxon pages](#) in the GBP, to expand its accessibility.



Figure 1. View of the interactive checklist of urban biodiversity of Guatemala City managed in the [Guatemala Biodiversity Portal](#). Available at: <https://biodiversidad.gt/portal/checklists/checklist.php?clid=12125>.

The integration of urban biodiversity data in the GBP allowed the generation of digital records that follow international standards (e.g., Darwin Core, Wiczorek et al. 2012) and FAIR (findable, accessible, interoperable, and reusable) principles (Wilkinson et al. 2016), facilitating their mobilization to global aggregators (GBIF.org 2024). Data cleaning tools (e.g., geographic and taxonomic cleaning, Pearson 2021) in the GBP also improved the information management, increasing the accuracy of each observation and specimen record digitized. Furthermore, the resulting interactive checklists provide a way to synthesize and review the data for the different taxa, having the opportunity to remain



constantly updated as sources of information become available. Therefore, curated species checklists for Guatemala City will become an important contribution and reference for related studies across the country. Similar to other regions (Yáñez-Ayabaca et al. 2023), accessibility to edit online biodiversity resources has opened the door for collaboration among Guatemalan biologists, engaging a broad community of researchers and students from national institutions. The presentation will address more about the functionality and effectiveness of interactive checklists, and the impact of online biodiversity resources in Guatemala.

## Keywords

biological surveys, conservation, digitization, outreach, Symbiota, GBIF

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## Conflicts of interest

The authors have declared that no competing interests exist.

## References

- Castillo-Cabrera F, Wellmann T, Haase D (2021) Urban Green Fabric Analysis Promoting Sustainable Planning in Guatemala City. *Land* 10 (18): 1-26. <https://doi.org/10.3390/land10010018>
- CONAP (2022) Lista de Especies Amenazadas de Guatemala. Publicación técnica No. 02-2022. Consejo Nacional de Áreas Protegidas. Guatemala. URL: <https://conap.gob.gt/wp-content/uploads/2022/12/Lista-de-Especies-Amenazadas-en-Guatemala-LEA-2.pdf>
- GBIF.org (2024) GBIF Occurrence Download. <https://doi.org/10.15468/dl.em6nrb>. Accessed on: 2024-8-22.
- Gries C, Gilbert E, Franz N (2014) Symbiota – A virtual platform for creating voucher-based biodiversity information communities. *Biodiversity Data Journal* 2 <https://doi.org/10.3897/bdj.2.e1114>
- IUCN (2024) The IUCN Red List of Threatened Species. Version 2021-3. <https://www.iucnredlist.org>. Accessed on: 2024-7-06.
- Orellana KS, Lopez Z, Yoshimoto J, Quezada M, Prado L, Ambrocio AL, Dávila L, Barrios-Izás M, Bustamante M, Franz N, Gilbert E (2023) Digitalización de colecciones

biológicas en el portal Symbiota de Biodiversidad de Guatemala. In: Schuster J, Yoshimoto J, Monzón J (Eds) Biodiversidad de Guatemala. Vol. 3. Universidad del Valle de Guatemala, Guatemala, 444 pp. URL: <https://zenodo.org/records/10424127> [ISBN 978-9929-8342-2-4].

- Pearson K (2021) Data Cleaning. In: Symbiota Support Hub (2024). Symbiota Documentation. [https://biokic.github.io/symbiota-docs/coll\\_manager/data\\_cleaning/](https://biokic.github.io/symbiota-docs/coll_manager/data_cleaning/). Accessed on: 2024-6-27.
- Pearson K, Walker L (2021) Checklists. In: Symbiota Support Hub (2024). Symbiota Documentation. <https://biokic.github.io/symbiota-docs/user/checklist>. Accessed on: 2024-6-27.
- Wieczorek J, Bloom D, Guralnick R, Blum S, Döring M, Giovanni R, Robertson T, Vieglais D (2012) Darwin Core: An Evolving Community-Developed Biodiversity Data Standard. PLoS ONE 7 (1). <https://doi.org/10.1371/journal.pone.0029715>
- Wilkinson MD, Dumontier M, Aalbersberg IJ, et al. (2016) The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data 3: 160018. <https://doi.org/10.1038/sdata.2016.18>
- Yáñez-Ayabaca A, Benítez Á, Molina R, et al. (2023) Towards a dynamic checklist of lichen-forming, lichenicolous and allied fungi of Ecuador - using the Consortium of Lichen Herbaria to manage fungal biodiversity in a megadiverse country. The Lichenologist 55 (5). <https://doi.org/10.1017/S0024282923000476>